

CHANNELS FROM CATAÑO BAY TO SAN JUAN HARBOR,
PORTO RICO.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORTS ON
PRELIMINARY EXAMINATION AND SURVEY OF CHANNELS
FROM CATAÑO BAY TO SAN JUAN HARBOR, PORTO RICO.

JANUARY 5, 1915.—Referred to the Committee on Rivers and Harbors and
ordered to be printed, with illustration.

WAR DEPARTMENT,
Washington, December 17, 1915.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, dated 16th instant, together with copies of reports from Col. S. W. Roessler and Col. F. V. Abbot, Corps of Engineers, dated December 11, 1913, and August 31, 1915, with map, on preliminary examination and survey, respectively, of channels from Cataño Bay to San Juan Harbor, Porto Rico, made in compliance with the provisions of the river and harbor act approved July 25, 1912.

Very respectfully,

LINDLEY M. GARRISON,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 16, 1915.

From: The Chief of Engineers, United States Army.

To: The Secretary of War.

Subject: Preliminary examination and survey of channels from
Cataño Bay to San Juan Harbor, Porto Rico.

1. There are submitted herewith for transmission to Congress report dated December 11, 1913, by Col. S. W. Roessler, Corps of

Engineers, and report dated August 31, 1915, with map, by Col. F. V. Abbot, Corps of Engineers, on preliminary examination and survey, respectively, authorized by the river and harbor act approved July 25, 1912, of channels from Cataño Bay to San Juan Harbor, Porto Rico.

2. Cataño Bay is understood to be the lower portion of Caño San Fernando, which is a tidal slough draining a considerable swamp area on the southerly side of San Juan Bay. A channel about 6 feet deep and 50 feet wide has been maintained into Cataño Bay by a company operating a ferry line between San Juan and Cataño. The traffic between these places, however, does not all pass through this bay, a portion being handled at piers located on the north shore of Cataño Point. Traffic by means of these piers is subject to occasional interruption by rough weather, and the district officer believes that with a suitable channel and street on the south side of the point a considerable portion of this commerce would be transferred to that side. Cataño is the outlet for a large fruit growing section. This traffic amounts to about 8,000 tons per year, and the total commerce is estimated by the district officer to amount to 50,000 tons per annum, in addition to which the ferries carry approximately 1,800,000 passengers per year between San Juan and Cataño. He submits a plan of improvement providing for an entrance channel 100 feet wide and 8 feet deep at mean low water, and the dredging of Cataño Bay to a similar depth. If a pipe line dredge becomes available, it is proposed to do the entire work at one time, at an estimated cost of \$26,000; but if the work must be done by clam-shell dredges which are now available, it is proposed to limit the work for the present to the area shown east of the line CDE on the accompanying map, at an estimated cost of \$26,000, leaving the remainder to be done at some future time, at a further cost of \$15,000. The district officer is of opinion that the locality is worthy of improvement to this extent, but recommends that the beginning of work on the project be made contingent upon the passage by the local legislature of an act providing for the utilization of any land that may be reclaimed as an incident to the work, in a manner satisfactory to the Secretary of War, and that funds obtained from the sale or lease of such reclaimed lands be paid to the Federal Government at stated intervals in reimbursement of expenditures made for improvement up to a maximum of \$13,425. The division engineer concurs in the views and recommendations of the district officer.

3. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to its report herewith, dated October 26, 1915, concurring in the views of the district officer and the division engineer.

4. After due consideration of the above-mentioned reports, I concur in the views of the district officer, the division engineer, and the Board of Engineers for Rivers and Harbors, and therefore report that the improvement by the United States of channels from Cataño Bay to San Juan Harbor, Porto Rico, is deemed advisable to the extent of providing an entrance channel 100 feet wide and 8 feet deep at mean low water, and dredging to similar depth within the bay, approximately as shown on the accompanying map, at an estimated cost of \$26,000 for first construction and about \$1,000 every four years for maintenance; provided, that no part of the money appropriated for

the improvement of Cataño Bay, Porto Rico, shall be expended until the Government of Porto Rico shall have enacted a law providing for the sale, lease, or other utilization, in a manner satisfactory to the Secretary of War, of all lands belonging to the United States or to the people of Porto Rico and reclaimed as an incident to this work and for turning all funds derived from the sale or lease of such reclaimed lands into a separate fund in the insular treasury, to be paid at stated intervals to the Government of the United States in reimbursement for the expenditures of that Government upon the dredging and reclamation work proposed, until such reimbursement shall have amounted to the sum of \$13,425. The entire estimate of \$26,000 should be provided in one appropriation.

DAN C. KINGMAN,
Chief of Engineers, United States Army.

REPORT OF BOARD OF ENGINEERS FOR RIVERS AND HARBORS ON
SURVEY.

[Third indorsement.]

THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
October 26, 1915.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. The following is in review of the district officer's reports authorized by the act of July 25, 1912, on preliminary examination and survey of "Channels from Cataño Bay to San Juan Harbor, Porto Rico."

2. Cataño Bay is a part of the general harbor of San Juan, situated opposite the city of San Juan, in the vicinity of Cataño Point, on which is the village of Cataño. The range of tide is about 1.1 feet. Some of the commerce of the locality is handled on the north side of the point, which is exposed to the seas caused by northerly winds, but the greater part of the commerce is on the south side of the point in Cataño Bay.

3. Since some time prior to 1898 a channel about 6 feet deep and 50 feet wide has been maintained by a company operating a ferry between San Juan and Cataño. The principal commerce is carried on by this ferry, but private boats and launches do a considerable business and also handle a large number of passengers. The total annual commerce is given as about 75,000 tons, and the number of passengers carried 1,800,000.

4. The district officer presents a plan of improvement, shown on the accompanying tracing, which provides for a depth of 8 feet. Two methods of procedure are outlined: (1) Assuming that the work must be done by clam-shell dredges now available; in this case it is proposed to limit the work for the present to that shown east of the line CDE; the estimate on this basis is \$26,000, and for completion at some future time \$15,000 additional, making the total \$41,000; (2) if a pipe-line dredge will become available; in this case it is proposed to do the entire work at once at an estimated cost of \$26,000.

5. In connection with the work it is proposed to reclaim certain lands, and the district officer recommends that the beginning of work on the project be made contingent upon the passage by the local legislature of an act providing for the utilization of any land that may be reclaimed as an incident to the work in a manner satisfactory

to the Secretary of War, so that the funds obtained from the sale or lease of such lands shall be paid to the Federal Government in reimbursement of the expenditures made by that Government upon the work to an amount not exceeding \$13,425.

6. The summary of the district officer's recommendations is as follows:

1. That a project be adopted providing for dredging Cataño Bay to a depth of 8 feet and for dredging and maintaining an entrance channel 100 feet wide and 8 feet deep at mean low water. (To be dredged 10 feet deep to provide for future maintenance.)

2. That an appropriation of \$26,000 be made at this time. It is estimated that this sum will be sufficient to complete the entire project in case a pipe-line dredging plant becomes available due to projected work in San Juan Harbor, or that it will be sufficient to provide for the present imperative needs of the locality in case no such plant becomes available.

3. In case land suitable for residential purposes is reclaimed as an incident to the work the Federal Government is to be reimbursed to the amount of about \$13,425. The net ultimate cost would then be \$12,575 if done in connection with the San Juan Harbor project by a pump dredge. If clam-shell dredges are used reclamation of much of the land will be impracticable, and the net ultimate cost will be \$41,000, of which only \$26,000 are recommended for immediate appropriation.

7. The improvement contemplated would not only be of material benefit to a considerable commerce, but it would greatly improve the sanitary conditions of the locality and make practicable the commercial development of the shores of the bay. The amount involved seems reasonable when compared with the volume of commerce and amount of passenger traffic to be affected, especially in view of the partial reimbursement of the United States that may be secured through the proceeds from reclaimed lands, as proposed by the district officer. The board therefore concurs with the district officer and the division engineer, and recommends the adoption of the project as proposed approximately on the lines shown on the map at an estimated cost of \$26,000 and about \$1,000 every four years for maintenance, provided that no part of the money appropriated for the improvement of Cataño Bay, Porto Rico, shall be expended until the government of Porto Rico shall have enacted a law providing for the sale, lease, or other utilization, in a manner satisfactory to the Secretary of War of all lands belonging to the United States or to the people of Porto Rico and reclaimed as an incident to this work, and for turning all funds derived from the sale or lease of such reclaimed lands into a separate fund in the insular treasury to be paid at stated intervals to the Government of the United States in reimbursement for the expenditures of that Government upon the dredging and reclamation work proposed until such reimbursement shall have amounted to the sum of \$13,425. The entire sum of \$26,000 should be provided in one appropriation.

8. In compliance with law, the board reports that, except as contemplated by the above recommendations, there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated therewith to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the Board:

W. M. BLACK,
Colonel, Corps of Engineers,
Senior Member of the Board.

PRELIMINARY EXAMINATION OF CHANNELS FROM CATAÑO BAY TO
SAN JUAN HARBOR, P. R.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
PORTO RICO DISTRICT,
New York, N. Y., December 11, 1913.

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army
(Through the Division Engineer).

Subject: Preliminary examination of channels from Cataño Bay to
San Juan Harbor, P. R.

1. The following report of a preliminary examination of channels from Cataño Bay to San Juan Harbor, P. R., authorized by the river and harbor act approved July 25, 1912, is hereby submitted.

2. The locality has been carefully examined by Capt. E. J. Dent, Corps of Engineers, resident assistant to the district engineer in San Juan, P. R. Capt. Dent's description and recommendation are quoted in full and submitted as a part of this report:

3. The waterways referred to are shown on U. S. C. & G. S. Chart No. 908. A blue print¹ is inclosed on which some of the changes have been indicated. Cataño Bay is understood to be the portion of Caño San Fernando from the bridge to its mouth. At the present time a pile bridge over Caño San Fernando on the road running south-southeast from Cataño limits the navigation on that waterway above the bridge to boats and scows less than 6 feet in height and 10 feet in width. A petition has been received requesting that the clear opening in that bridge be increased to 10 feet in height and 20 feet in width.

4. As may be seen from the chart, the Caño San Fernando is a tidal slough draining a considerable swamp area. The daily range of tides averages about 1.1 feet and the fresh-water flow from adjacent solid land is negligible as compared with the flow due to the tides. The prevailing wind, as shown on the accompanying print, is from the east throughout the year, but the ocean swell entering the mouth of San Juan Harbor strikes the north shore of Cataño Point in a nearly perpendicular direction. During storms, particularly storms from the north, the swell on the north beach is sufficiently strong to prevent the landing of boats on that side. The east end of Cataño Point had in 1911 been extended to a point about 300 feet beyond that shown by the survey of 1899-1900. Since 1911 the shore line has cut back about 120 feet from its position in 1911. Cataño Point originally included a narrow hook extending in a southerly direction, but shortly before the American occupation in 1898 a channel was dredged across this hook, leaving an island on the south side of the channel.

5. So far as the present and prospective commerce of Cataño is concerned, the only portion of the channels from Cataño Bay to San Juan Harbor that need be considered is the section from the Caño San Fernando Bridge to the 8-foot contour in San Juan Harbor. Since some time prior to 1898 a channel about 6 feet in depth and at present about 50 feet in width has been maintained by a company operating a ferry line between San Juan and Cataño and a railroad from Cataño to Bayamón, about 5 miles distant. Under their franchise this company is required to maintain a channel of sufficient depth and width to permit the operation of their ferryboats. The largest of these boats is 78 feet long, 63 net tons, 5 feet draft. To aid in the maintenance of this channel a sheet-pile bulkhead was built on the south side of the channel where it cuts through the original hook of Cataño Point.

6. At the present time the railroad and ferry line above mentioned have a private terminal in Cataño Bay and Mr. Marcus Canejas has a small temporary pier for loading stone near the Caño San Fernando bridge. In addition to these landings, which are not open to public use, there are numerous bulkheads from which scows and small boats are loaded and discharged. They are not kept in repair and can hardly be considered as terminal facilities in any sense of the word. Adjacent to the ferry landing there is a boat yard for boats up to 75 tons,

¹ Not printed.

and there is a boat yard of similar capacity at the east end of Cataño Point. At Cataño as at other points on this island the land underlying harbor areas is owned by the Federal Government. In connection with any improvement of Cataño Bay it is entirely feasible to establish a bulkhead line and to reclaim a strip of about 75 feet in width from the ferry landing to the small hook near the east end of Cataño Point. This strip could be used as a marginal street, and bulkhead affording ample space for all the present or prospective traffic, and the ownership would be vested in the Federal Government until transferred. Very few, if any, of the owners of adjacent land have any riparian rights. There are no water-power developments possible in connection with the improvement of this bay.

7. In the event that, in connection with the improvement of the channel, any public land is reclaimed the receipts from the sale or lease of such land should be set aside to reimburse the Federal Government for any expenditures it may make. In the case of Cataño the land titles are very much involved, and in order to simplify the subject of reimbursement of the Federal Government it is desirable that the improvement of Cataño Bay be consolidated with the improvement of San Juan Harbor. In the event of further work being done in the main harbor a considerable area of swamp land owned either by the Federal or Insular Government should be reclaimed. In the case of Cataño there are also some private claimants. But in the event that no further work in the main harbor is undertaken the work of Cataño would probably be warranted.

8. The traffic between San Juan and Cataño does not all pass through Cataño Bay. At the present time there are one public pier and four private piers on the north shore of Cataño Point. Traffic by means of these piers is subject to occasional interruption by rough weather. With a suitable marginal street on the south side of the Point and with an adequate channel, it is probable that a considerable portion of the traffic now handled on the north side of the Point would be transferred to the south side.

9. The following statistics as to traffic are believed to be fairly reliable; an exact census of this traffic should be available in the near future:

Total passengers per day via launches landing on north beach	3,000
Total passengers per day via ferry landing in Cataño Bay	2,000
Automobiles per day via ferry	23
Crates or boxes of fruit per year (estimated tons)	8,500
Miscellaneous freight—fertilizer, fruit crates, foodstuffs, etc. (tons)	50,000

10. This traffic results from the fact that Cataño is a natural outlet for a large fruit-growing section. No matter what railroad facilities are furnished in the future it is believed that a large percentage of this traffic will always follow the Cataño route. The Porto Rico Fruit Exchange has recently constructed a fine concrete warehouse, and the numerous inquiries received in this office in regard to projected wharves, etc., is evidence that the public at least expect an increase rather than a diminution in the volume of business.

11. In November, 1912, the registered boats engaged in this traffic were:

One ferryboat, new, 78 feet long; tonnage, net, 63; draft, 5 feet.

One ferryboat, old, 61 feet long; tonnage, net, 25; draft, 4½ feet.

One motor boat, new, 40 feet long; tonnage, net, 28; draft, about 4 feet.

One motor boat, old, 30 feet long; tonnage, net, 12; draft, about 4 feet.

One motor boat, old, 32 feet long; tonnage, net, 10; draft, about 4 feet.

And six motor boats under 5 tons each.

There were, besides these power boats, about 17 large sailboats licensed for the carrying of freight and passengers between San Juan and Cataño. The smaller motor boats did much towing of loaded lighters and scows in the same service, the number of scows engaged being, as near as can be ascertained, 11.

12. The dimensions of the channel and basin necessary for Cataño Bay are not great and the cost should not be excessive. In view of the extent of the traffic involved, the work would appear to be worthy of being undertaken by the Federal Government.

13. Capt. Dent's recommendation that the present and prospective commerce at Cataño Bay is sufficient to justify an improvement of the harbor by the General Government is concurred in. It is further recommended that a survey be authorized to determine the probable cost of the improvement, which survey will also include the delineation of the bulkhead line on the Cataño side of the river and the location of a proposed marginal street.

14. The cooperation of the insular government toward the construction of the bulkhead and the marginal street will be sought, and an effort made to obtain

reimbursement for any flat or swamp lands which may be reclaimed as a result of the proposed improvement. Capt. Dent's recommendation that the work in question be consolidated with and made a part of the general improvement of San Juan Harbor is concurred in.

S. W. ROESSLER,
Colonel, Corps of Engineers.

[First indorsement.]

OFFICE OF DIVISION ENGINEER, EASTERN DIVISION,
New York City, December 22, 1913.

To the CHIEF OF ENGINEERS:

Concurring in the views and recommendations of the district engineer officer.

W. M. BLACK,
Colonel, Corps of Engineers.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
December 30, 1913.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

For reasons stated herein, the board concurs with the district officer and the division engineer in recommending a survey in order to determine the extent and advisability of the improvement.

For the board:

W. M. BLACK,
Colonel, Corps of Engineers,
Senior Member of the Board.

SURVEY OF CHANNELS FROM CATAÑO BAY TO SAN JUAN HARBOR,
PORTO RICO.

WAR DEPARTMENT,
UNITED STATES ENGINEER OFFICE,
PORTO RICO DISTRICT,
New York, N. Y., August 31, 1915.

From: The District Engineer Officer.

To: The Chief of Engineers, United States Army
(Through the Division Engineer).

Subject: Report of survey of channels from Cataño Bay to San Juan Harbor, Porto Rico.

1. The river and harbor act approved July 25, 1912, directed that a preliminary examination be made of the above waterway. The report of that examination was submitted on December 11, 1913, and a survey was authorized. The survey has been completed, and a map showing present conditions and the work proposed to be done accompanies this report.

2. *Commerce.*—The statistics in regard to traffic as given in paragraph 9 of the preliminary report have, as a result of a careful investigation made by the insular government, been proven to be essentially correct. The ferries carry approximately 1,800,000 passengers per year between San Juan and Cataño, and this business is increasing. The fruit traffic amounts to about 8,000 tons per year.

and the shipments of general merchandise over the ferry route alone are about 18,000 tons per year. When the barge traffic in general merchandise is included the amount previously reported, 50,000 tons per year, is considered conservative.

3. *Draft of vessels.*—If the proposed depth of 8 feet at mean low water be provided, it is believed that ample provision will have been made for present and prospective ferry boats and for the largest lighters that would under any circumstances be engaged in this traffic. The largest ferry boat now engaged in this traffic has a draft of 5 feet, and the largest lighters in general use in this harbor have a draft of about 6 feet. An allowance for unusually low tides and a further allowance for the squat of a boat under way is necessary, and a depth of 8 feet at mean low water would not be excessive. The cross section of the existing channels should be increased to reduce the resistance encountered by present ferry boats and to reduce the disturbance produced by such boats during their passage through the channel.

4. *Bulkheads.*—The accompanying map shows the location of the approved bulkhead line, warehouse and cargo-handling space, and marginal street. It should be noted that throughout nearly its entire length the marginal street and the warehouse and cargo-handling space are located outside of the low-water line and they will therefore lie mainly on land owned by the Federal Government. The bulkhead line simply indicates the limit to which the Secretary of War will permit solid structures to extend by authorizations that he may hereafter issue. This plan provides room for ample waterfront facilities, and while no provision for actual construction of bulkheads, etc., has been made, the Secretary of War retains the power to prevent the use of this space for any purpose not in harmony with the general plan for the entire waterfront. The small sections above the low-water line, which according to this plan are reserved for waterfront development, are owned by the insular government and the plan has the approval of that government. No further provision for additional waterfront facilities is considered necessary and no requirements as to the construction of such facilities are proposed.

5. *Project.*—The limits of the proposed dredging are shown on the accompanying map. It is proposed to dredge Cataño Bay from the Caño San Fernando Bridge to the line AB to a uniform depth of 8 feet at mean low water. From the line AB to the 10-foot contour in San Juan Harbor is proposed to dredge an entrance channel which at mean low water will have a minimum width of 100 feet and a minimum depth of 10 feet, such width and depth being considered suitable for boats of a maximum draft of $5\frac{1}{2}$ feet and for scows of a maximum draft of 6 feet, and an allowance having been made for probable future shoaling due to the wash of sand and coral débris around the easterly end of Cataño Point.

6. Soundings throughout the bay and around Cataño Point were made in 1913 in connection with the establishment of bulkhead lines. A brief examination indicated that no change had occurred since that date, and these soundings have been used in the preparation of the map.

7. *Probings.*—To determine the character of the material to be dredged, probings over the entire area were made by means of a steel rod. A total of 126 probings were made. In nine cases it was

impossible to penetrate to the full depth of 10 feet, but four of these were outside of the adopted lines. Coral rock appears on the north side of Cataño Point but no such rock was found on the south side. There was a considerable quantity of coral débris, pieces not over 3 inches in length, in the entrance channel; in the section of the channel between Cataño Point and the small island south of the channel this débris was mixed with fine sand, forming quite compact masses. It was in this section that in the case of five probings the full depth could not be reached. In the basin the material is soft mud sometimes mixed with fine sand.

8. *Maintenance*.—The water flowing back and forth through Cataño Bay contains very little suspended matter and the maintenance of full depths within the bay should require no additional dredging for many years. There is apparently a littoral drift of sand and coral débris around the easterly end of Cataño Point which will probably necessitate occasional redredging in the entrance channel. No data are available from which an estimate of the extent of such drift can be determined. It is believed that an expenditure of \$1,000 every four or five years will be sufficient for the maintenance of this channel. A jetty of sufficient length to protect this channel can be constructed in the future if it should prove necessary. Such a jetty could in all probability be constructed for about \$5,000. If the material dredged be disposed of so as to close the gap between the island and the swamps on the south side of the bay the increased flow of water through the entrance channel should aid in its maintenance.

9. *Plans for dredging*.—In the prosecution of this work two plans have been considered; the first based on the assumption that the work must be done by clamshell or orange-peel bucket dredges now available in this harbor and the second based on the assumption that a large pipe-line dredge will be brought to San Juan for work in the main harbor and may also be used in Cataño Bay.

10. *First plan*.—In the first plan there will be no material gain by doing the entire work under a single contract, and it is therefore proposed to dredge the entrance channel and the bay as far west as the line CDE. This will provide for present needs, and the remainder of the basin can be dredged when such extension becomes imperative. The estimate of cost for the work to be done at once is:

91,000 cubic yards at 25 cents	\$22, 750
Contingencies	3, 250
	26, 000

For completion of the project at a later date the estimate becomes:

Cost of work to be done now	\$26,000
Additional work, 60,000 cubic yards at 25 cents	15, 000
	41, 000

Total cost of project

11. *Second plan*.—In the second case—that is, if a pipe-line dredge is available—all work under the project should be done at one time while such plant is available. The estimate of cost for the entire project under this condition is:

174,000 cubic yards at 12½ cents	\$21, 250
Dikes and contingencies	4, 750
	26, 000

It is doubtful whether a dredge such as would be used in this case would be able to operate in a channel only 100 feet in width and in the estimate an allowance of 23,000 cubic yards for increased width has been made.

12. *Filling marginal street, etc.*—If the work is done by a clam-shell dredge, a portion of the material may be disposed of behind the bulkhead line on the north side of the bay without additional expense to the United States. It is very desirable that a portion of the material be so disposed of as this will result in the reclamation of the proposed water front and marginal street. No grades have been established, but it is roughly estimated that about 15,000 cubic yards could be advantageously used for this purpose in the section east of the Valdes Railroad terminal. If the work is done by pipe-line dredge, the area to be filled in on the north side of the bay may be too small to admit of its being used as a disposal area. In this event it is proposed to take the matter up with the local authorities and to offer to pay them for material that they may remove from within the limits of the project at the rate at which the Federal Government would otherwise be compelled to pay for its removal. This arrangement would make it possible for the local authorities, by paying the additional cost, to provide for the utilization of part of the material dredged from the bay in reclaiming the marginal street. The United States would be put to no additional expense in this connection.

In the event that the pipe-line dredge was working under contract with the United States, the unit price to be paid the local authorities under the above paragraph would be the contract price. If the work were being done by day labor, the unit price to be paid the local authorities would be the actual unit cost of removal of materials excavated by hired labor.

13. All material not disposed of behind the bulkhead line may be deposited in the swamps and shoal water on the south side of the bay or towed to a distance and dumped according to the method of dredging adopted. If deposited by pipe-line dredge in the swamps and shoal water an expenditure of approximately \$3,000 for dikes will make it possible to reclaim a parcel of publicly owned land. Such land should be in immediate demand for residences at a price that would largely pay for the work done in the interests of navigation. The essential features of one possible plan of reclamation may be summarized as follows:

Material available for land reclamation	_____cubic yards	159, 000
Average depth of fill	_____feet	8
Area of fill	_____square feet	537, 000
Owned by Insular Government	_____do	129, 000
Owned by Federal Government	_____do	408, 000
Reserved for streets, etc., 50 per cent	_____do	268, 500
Available for sale	_____do	268, 500
Value per square foot	_____	\$0. 05
Value of reclaimed land	_____	\$13, 425

14. This land is at present valueless and much of it is, due to its unsanitary condition, an actual menace to the community. It is recommended that the beginning of actual work on this project be made contingent upon the passage by the local legislature of an act providing for the utilization of any land that may be reclaimed as an incident to the work, in a manner satisfactory to the Secretary of War, and providing that the funds obtained from the sale or lease

of such lands be turned into a separate fund in the Insular Treasury and be paid to the Federal Government at stated intervals in reimbursement of the expenditures of that Government upon the dredging and reclamation work proposed until all of such expenditures shall have been reimbursed not in excess, however, of the maximum of \$13,425.

15. The act should also provide that all land belonging to the United States underlying the harbor areas and navigable waters of Porto Rico that may be filled in as an incident to this project, except such as may be specifically set aside for the use of the Federal Government, shall become the property of the people of Porto Rico, subject to such conditions as to its use as the Secretary of War may prescribe. Under this provision the Secretary of War could subdivide the land reclaimed into two classes. The first class should include such land as in his opinion will not be required for use in connection with the water-borne commerce in this locality. The regulations in regard to this class of land need go no further than necessary to insure the proper development and sale of such land within a reasonable time in order that the date for the reimbursement to the United States need not be unnecessarily delayed. The second class should include such land as in the opinion of the Secretary of War should be reserved for use in connection with present or future water-borne commerce of this locality. The regulations prescribed by the Secretary of War in regard to this class of land should be revised from time to time to meet the current needs of the locality. Such regulations might authorize the assumption of control by the Federal Government over such land in case of failure on the part of the local authorities to comply with the general instructions of the Secretary of War in regard thereto.

16. The form of local cooperation recommended in this case is in a general way similar to that recommended in the case of San Juan Harbor (H. Doc. No. 865, 63d Cong., 2d sess.). On May 24, 1915, in order to obtain the views of the local authorities, the following letter was addressed to the Governor of Porto Rico:

The river and harbor act approved July 25, 1912, called for a preliminary examination and survey of "Channels from Cataño Bay to San Juan Harbor, Porto Rico."

A final report on this examination and survey has been delayed pending a definite decision in regard to harbor lines in Cataño Bay. The harbor lines having been approved, a final report on the subject is now possible. There is inclosed herewith a map of Cataño Bay on which the proposed entrance channel and interior basin have been indicated. It is believed to be desirable that the work outlined be carried out in connection with the work proposed for San Juan Harbor as described in House Document 865, Sixty-third Congress, second session. If the project for San Juan Harbor be adopted by Congress, the plant required for that work will be available for work in Cataño Bay.

The proposed work in Cataño Bay, as well as the work in San Juan Harbor, involves the reclamation of swamp lands which should have considerable value as soon as the reclamation is completed. For this reason it is believed that the Federal Government should be to a considerable extent reimbursed from the proceeds derived from the sale of such lands.

In the case of Cataño Bay it has been estimated that approximately 537,000 square feet may be reclaimed to an average height of 6 feet above mean low water.

Not all of the property so reclaimed would be available for sale for building purposes. Assuming that one-half will, however, be available, and that the price of 5 cents per square foot would not be unreasonable, the value of the salable part of the reclaimed land would become \$13,425.

It is requested that we be informed whether in your opinion it will be reasonable to include in any appropriation that may be passed for dredging in Cataño Bay a provision that the appropriation shall not become effective until the insular government has enacted a law providing for the disposal of the reclaimed lands in a manner satisfactory to the Secretary of War, and providing that the proceeds from the sale or lease of such lands reclaimed as a result of the dredging work should be turned into a separate fund in the insular treasury and paid to the Federal Government at stated intervals in reimbursement for the expenditures of that Government upon the dredging and reclamation work proposed until all of such expenditures shall have been reimbursed, not in excess, however, of the sum of \$13,425.

17. The following reply from the Governor of Porto Rico, dated August 13, 1915, has been received:

I have the honor of acknowledging receipt of your letter of May 24, 1915, the reply to which had been delayed pending the reports of the commissioner of the interior and of the San Juan Harbor Board.

In the said letter you have requested me to inform you whether in my opinion "it will be reasonable to include in any appropriation that may be passed for dredging in Cataño Bay a provision that the appropriation shall not become effective until the insular government has enacted a law providing for the disposal of the reclaimed lands in a manner satisfactory to the Secretary of War, and providing that the proceeds from the sale or lease of such lands reclaimed as a result of the dredging work should be turned into a separate fund in the insular treasury and paid to the Federal Government at stated intervals in reimbursement for the expenditures of that Government upon the dredging and reclamation work proposed until all of such expenditures shall have been reimbursed, not in excess, however, of the sum of \$13,425."

My opinion is that a provision to that effect would be reasonable and proper; but for the sake of convenience and to avoid unnecessary delays and work I would be very glad if the following suggestions were considered in connection with the passage of the act appropriating the amount required for the dredging of the harbor at Cataño:

1. The approval by the Secretary of War of the manner of disposing of the reclaimed lands seems to be entirely unnecessary and should not be made a condition for the taking effect of the appropriation. The approval of the Governor of Porto Rico should be deemed to be sufficient.

2. It must be remembered that not all the land to be reclaimed belongs to the United States Government. Under the existing laws only part of the lands to be reclaimed belongs to the United States. The other lands are the property of the people of Porto Rico and do not have to be transferred to it in the bill making the appropriation for their reclamation.

3. The transfer of the land should be made as a part of the bill appropriating the money. It is suggested that the proposed bill be drafted following the provisions of the law providing for the dredging of San Juan Harbor.

Before closing, I desire to quote for your information the text of the resolution adopted by the San Juan Harbor Board, as follows:

"Be it resolved by the San Juan Harbor Board: That the Governor of Porto Rico is hereby informed that this board is very anxious to have the dredging of Cataño Bay performed, and recommends that the land so reclaimed be turned over to the Insular Government to be disposed of for the benefit of the people of Porto Rico, and that from the sale of such land, when made, a sum of not to exceed \$13,425 be paid over to the Federal Government at stated periods. And be it further resolved that, in the opinion of the board, it would be better to have the form of disposal of these lands, which property would be vested in the people of Porto Rico specified in the bill appropriating the necessary funds for the dredging of Cataño Bay, instead of as suggested by Col. Frederic V. Abbot of having the insular legislature prescribe the conditions under which such land shall be sold. And be it further resolved that this board grasps this opportunity to again strongly recommend to the Governor of Porto Rico, and through him to the Bureau of Insular Affairs and the Secretary of War the urgent necessity of obtaining the necessary funds to complete the dredging of San Juan Harbor as reported on and recommended by Maj. E. J. Dent. The increased shipping noted and the necessity of extending every possible port facility to vessels calling at this port makes it of the greatest importance, and it is urged on the authorities that this question be given their preferred attention."

I sincerely hope that special attention shall be given to this matter, which I consider to be of the greatest importance for the future development of this island.

18. It will be noted that the Governor of Porto Rico considers it reasonable and proper that the United States be reimbursed to the extent recommended in this report.

19. The Governor considers it unnecessary to provide for approval by the Secretary of War of the details of the law providing for the disposal and use of the reclaimed lands. This provision is considered desirable in order that the date for reimbursement of the United States may remain to a limited extent under the Federal control by having some designated Federal official in position to say whether the interests of the United States have been adequately protected by laws passed by the insular authorities.

20. Attention is invited to the resolution of the San Juan Harbor Board in which they state:

It would be better to have the form of disposal of these lands, which property would be vested in the people of Porto Rico, specify in the bill appropriating the necessary funds for the dredging at Cataño Bay instead of * * * having the insular legislature prescribe the conditions under which land shall be sold.

It is believed that it is wiser to leave the details of the methods by which the land owned by the people of Porto Rico is to be administered or disposed of to the Government of Porto Rico. The supervision of the Federal Government through the Secretary of War should be general in character and should go no further than may prove to be necessary to protect the interests of the Federal Government.

21. The form of local cooperation recommended is believed to be reasonable, if not generous. In connection with the excavation of the channel and basin in Cataño Bay, it is practicable to create valuable residential property where such is badly needed at the present time. The financial resources of the island and municipalities of Porto Rico are already strained to their limit to modernize existing structures and to provide improvements such as water supply, sewers, and street pavements where such have not been provided in the past. Under these conditions it is not considered advisable to require a cash contribution in advance of the sale of lands made valuable as a result of the improvement.

22. On the other hand, it is considered reasonable that the United States be reimbursed to such extent as may be possible from the proceeds of the sale of the reclaimed lands. Part of such lands are already owned by the United States and the part now owned by the people of Porto Rico is of little, if any, value at the present time.

SUMMARY OF RECOMMENDATIONS.

1. That a project be adopted providing for dredging Cataño Bay to a depth of 8 feet and for dredging and maintaining an entrance channel 100 feet wide and 8 feet deep at mean low water. (To be dredged 10 feet deep to provide for future maintenance.)

2. That an appropriation of \$26,000 be made at this time. It is estimated that this sum will be sufficient to complete the entire project in case a pipe-line dredging plant becomes available due to projected work in San Juan Harbor, or that it will be sufficient to provide for

the present imperative needs of the locality in case no such plant becomes available.

3. In case land suitable for residential purposes is reclaimed as an incident to the work the Federal Government is to be reimbursed to the amount of about \$13,425. The net ultimate cost would then be \$12,575 if done in connection with the San Juan Harbor project by a pump dredge. If clam-shell dredges are used, reclamation of much of the land will be impracticable and the net ultimate cost will be \$41,000, of which only \$26,000 are recommended for immediate appropriation.

FREDERIC V. ABBOT,
Colonel, Corps of Engineers.

[First indorsement.]

OFFICE OF DIVISION ENGINEER, EASTERN DIVISION,
New York City, October 5, 1915.

To the CHIEF OF ENGINEERS:

Concurring in the views and recommendations of the district engineer officer.

W. M. BLACK,
Colonel, Corps of Engineers.

[For report of Board of Engineers for Rivers and Harbors on survey see page 3.]

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